

# UTAH DAQ 2011-2012



## PM2.5 Workgroup

# Why we are here

- Public Health
  - DAQ has a mandate to do what's right for public health.
- Develop an Approvable SIP
  - DAQ and the State need a SIP that works. The agency has successfully developed the technical basis for an approvable PM2.5 SIP, and EPA is its close partner in achieving the approval.
- Partnerships and Education are Critical
  - To achieve a successful outcome, many parties will have to come together. The SIP development process will therefore be inclusive and transparent.
- The Process will be VERY Difficult!
  - Everyone has to be on board to get the best outcome.

# Public Involvement Process

- Consultant to manage process
  - Ensures transparency and neutrality
  - Assists in providing clear picture of DAQ/WG/Public roles
  - Assists WG in constituent involvement
- Purpose and Schedule of Meetings
  - WG 1 (Aug-Sep): Introduce Team and Process, Train for Roles, Discuss Strategy Menus/Feasibility, Assignments
  - WG 2 (October): Consult on Emissions Management Strategies, Rank and Prioritize
  - WG 3 (January 2012): Build Consensus on Emissions Management Strategies Following Modeling and Analysis
  - Public Presentation (April 2012): Gain Public Support and Identify Final Tasks
- Public Comment Program
  - All constituents and interested parties can comment at any time by visiting [www.govcomments.com](http://www.govcomments.com) and clicking the project link.

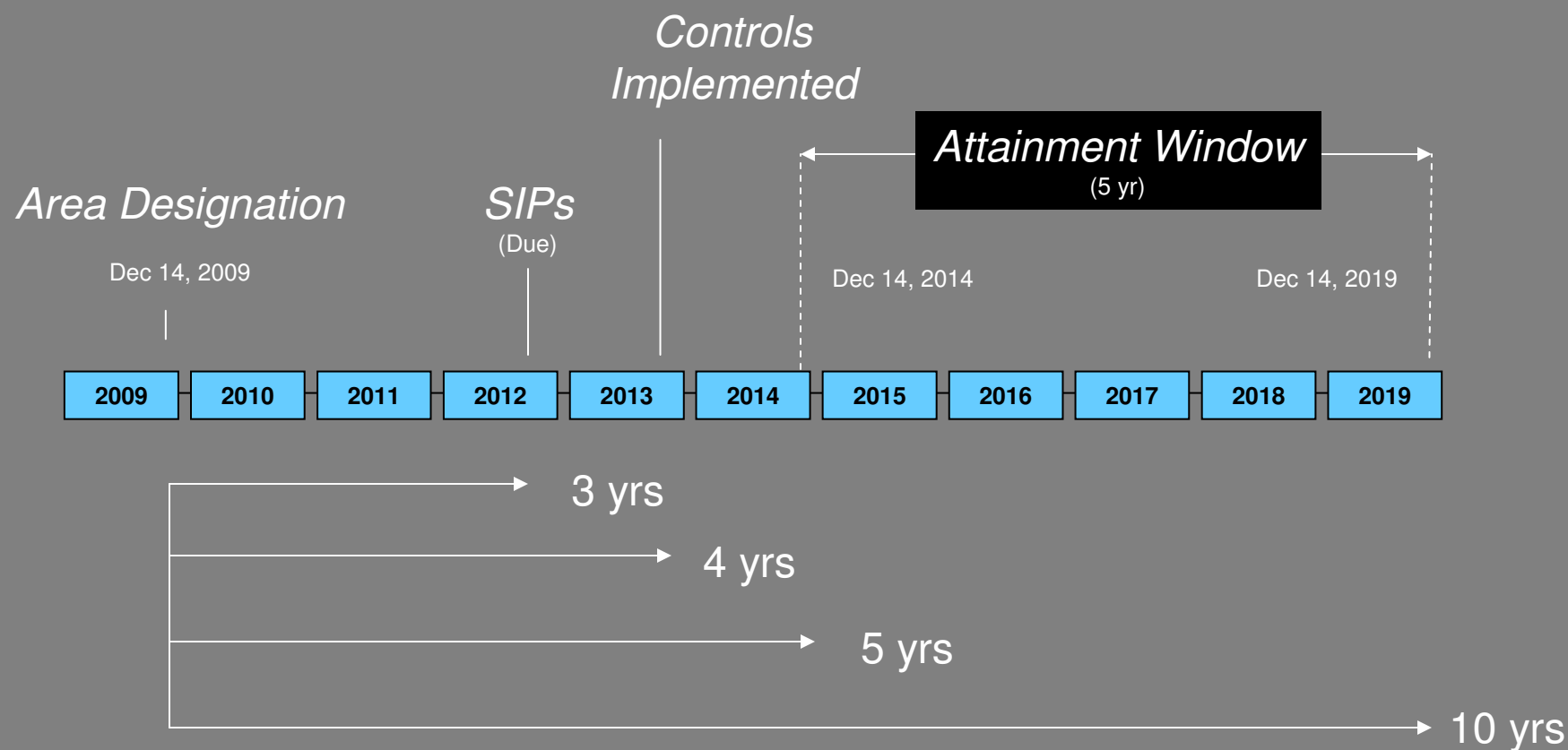


Utah

Department of Environmental Quality

Division of  
Air Quality

# Attainment Dates





Utah

Department of Environmental Quality

Division of  
Air Quality

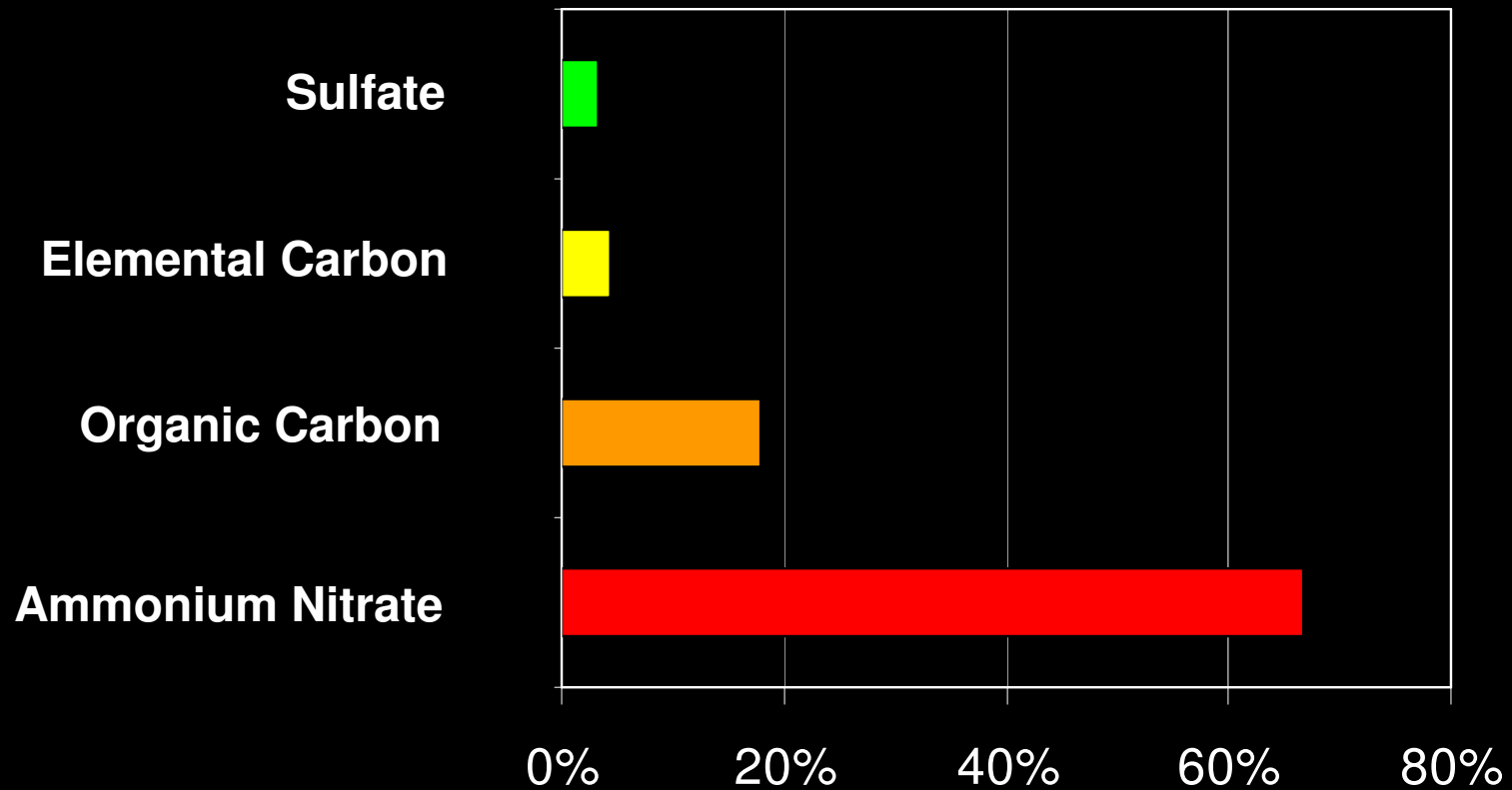


# What Does the Model Show?



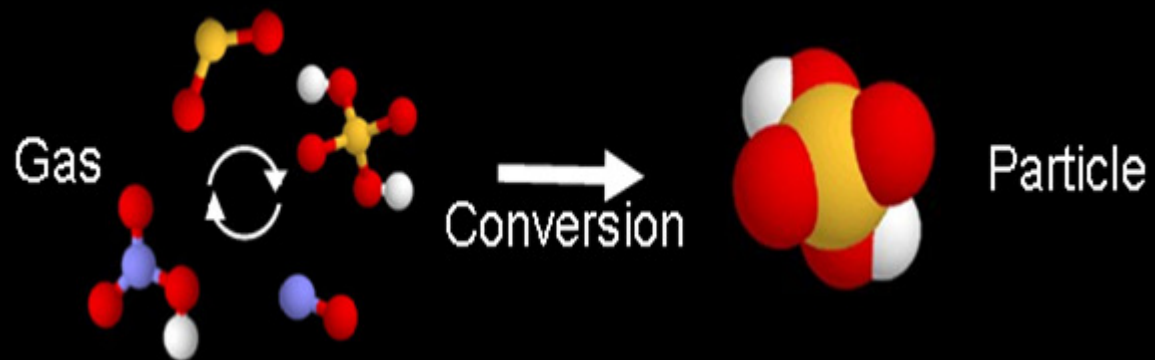
*Tyler Cruickshank  
Utah Division of Air Quality*

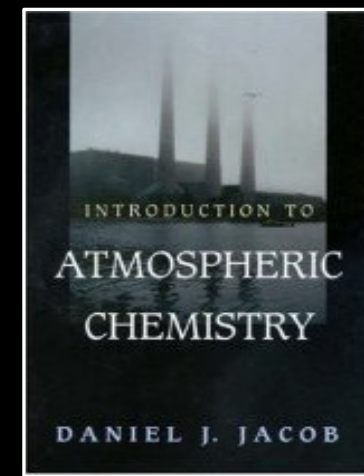
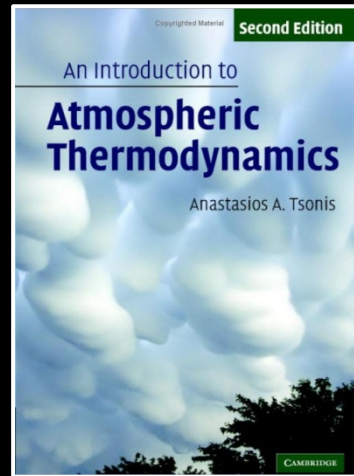
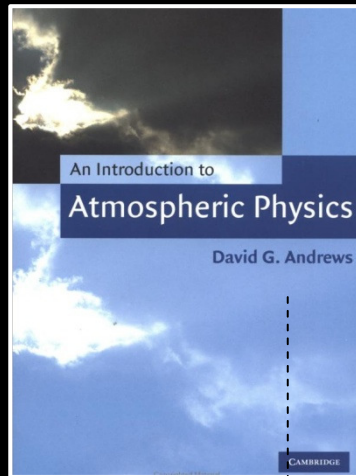
# What We Breathe





# PM2.5 Creation

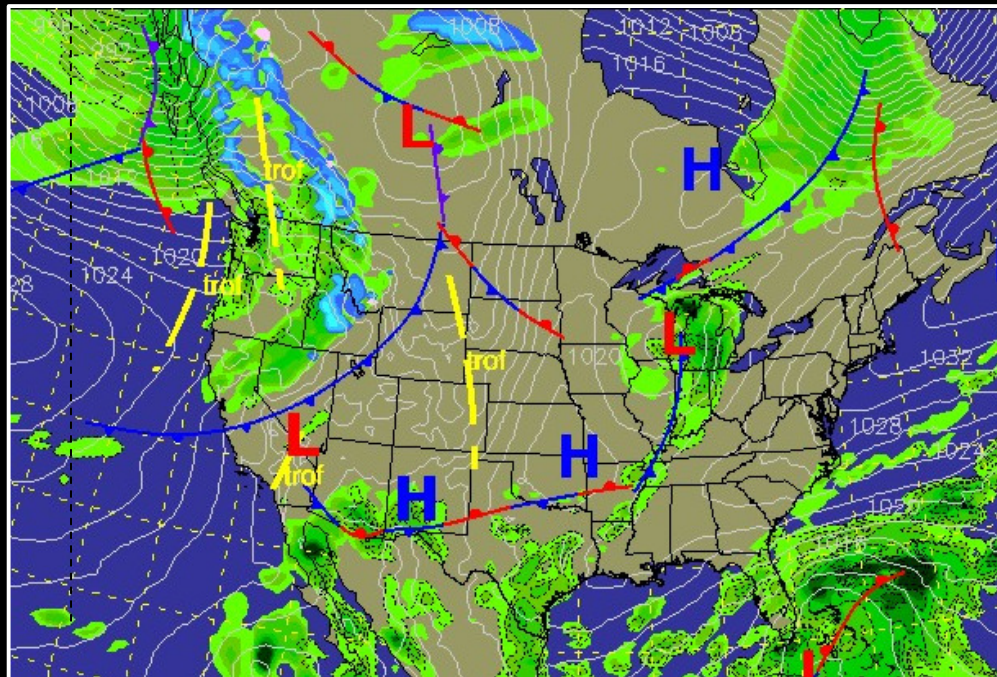




**Theoretical**

**to the**

**Practical**



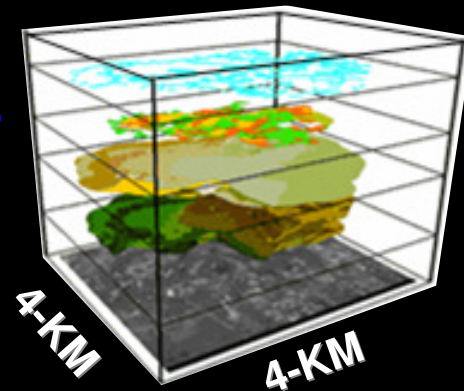
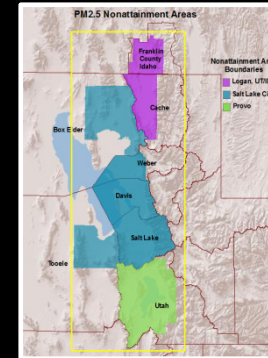
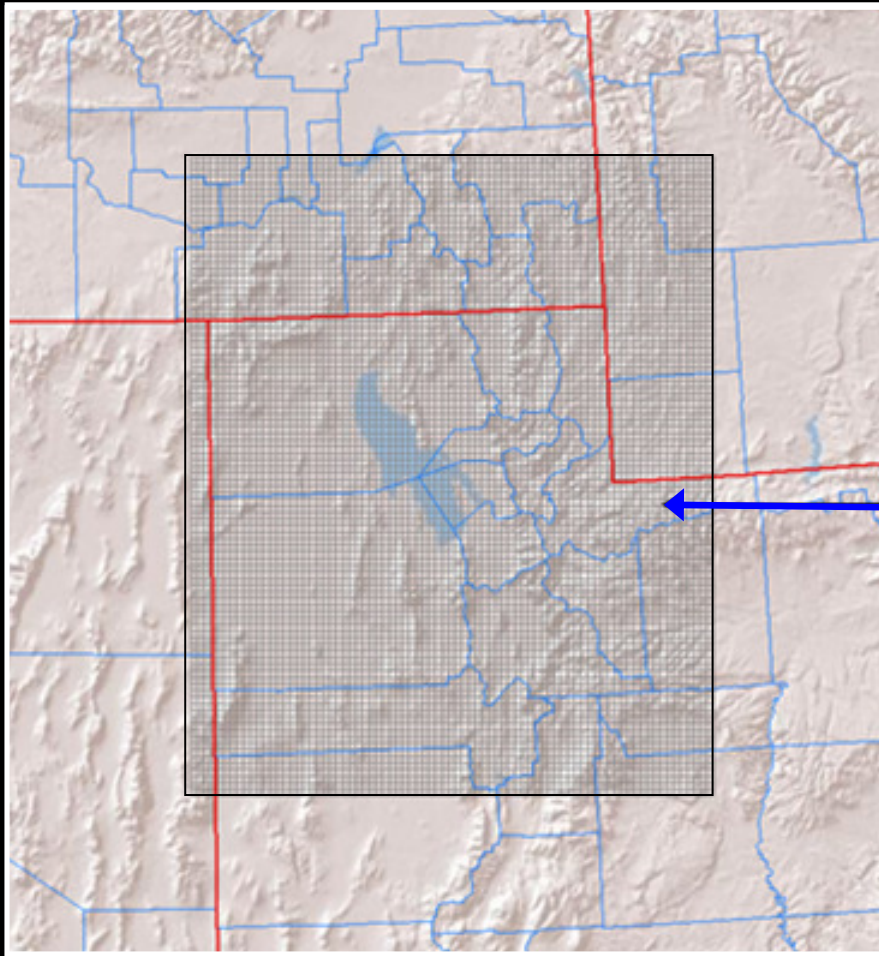
# Complex Terrain ...

## Complex Problem



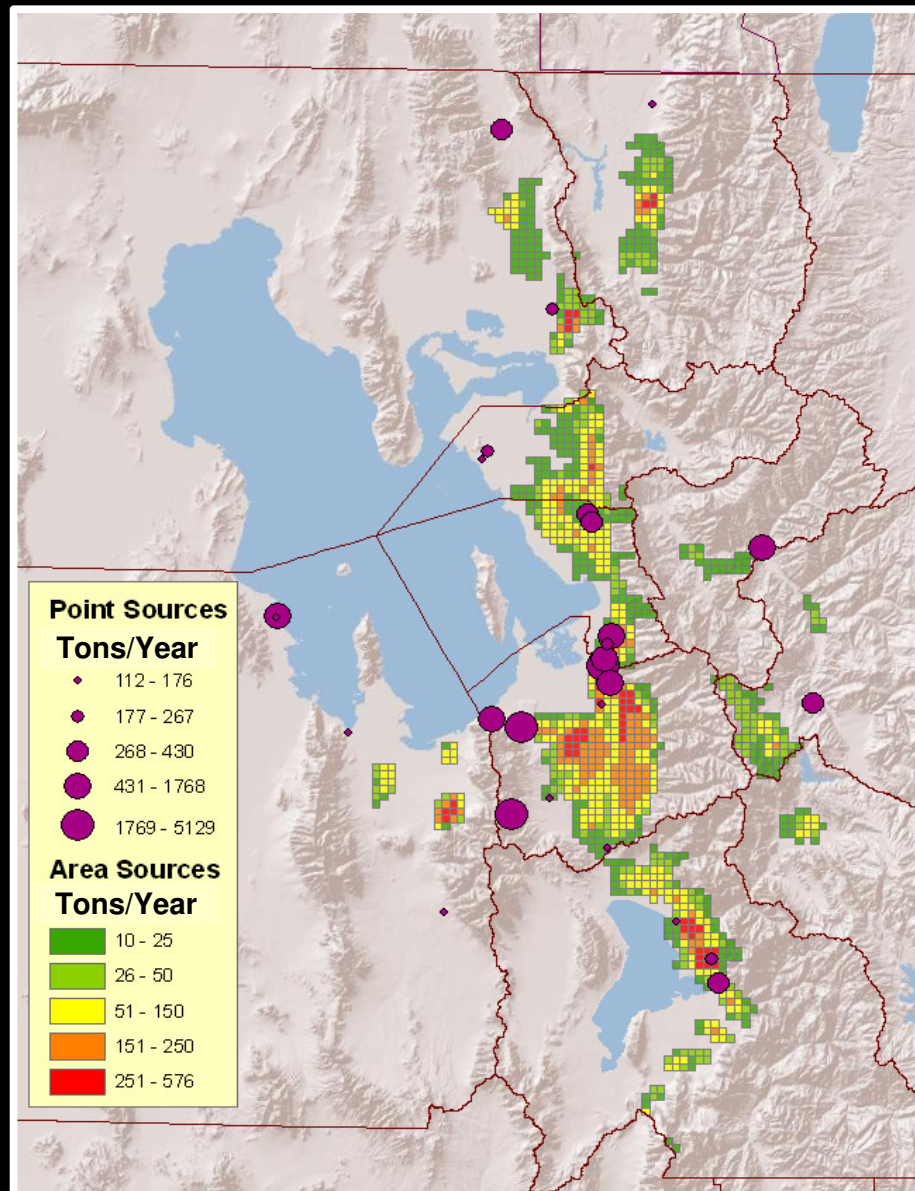


# Where are we modeling?



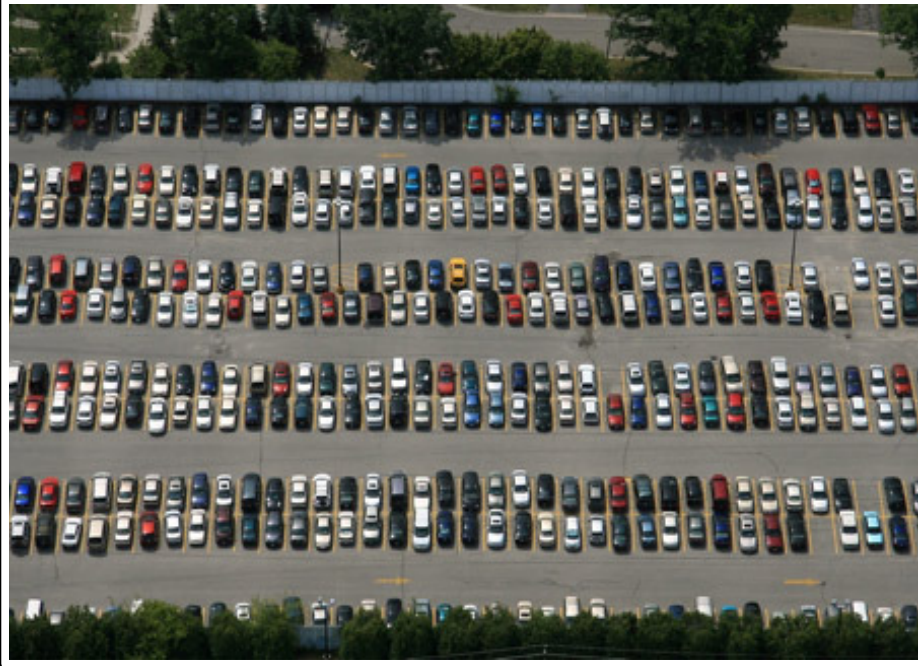
**3-Dimensional Grid**

# Emissions



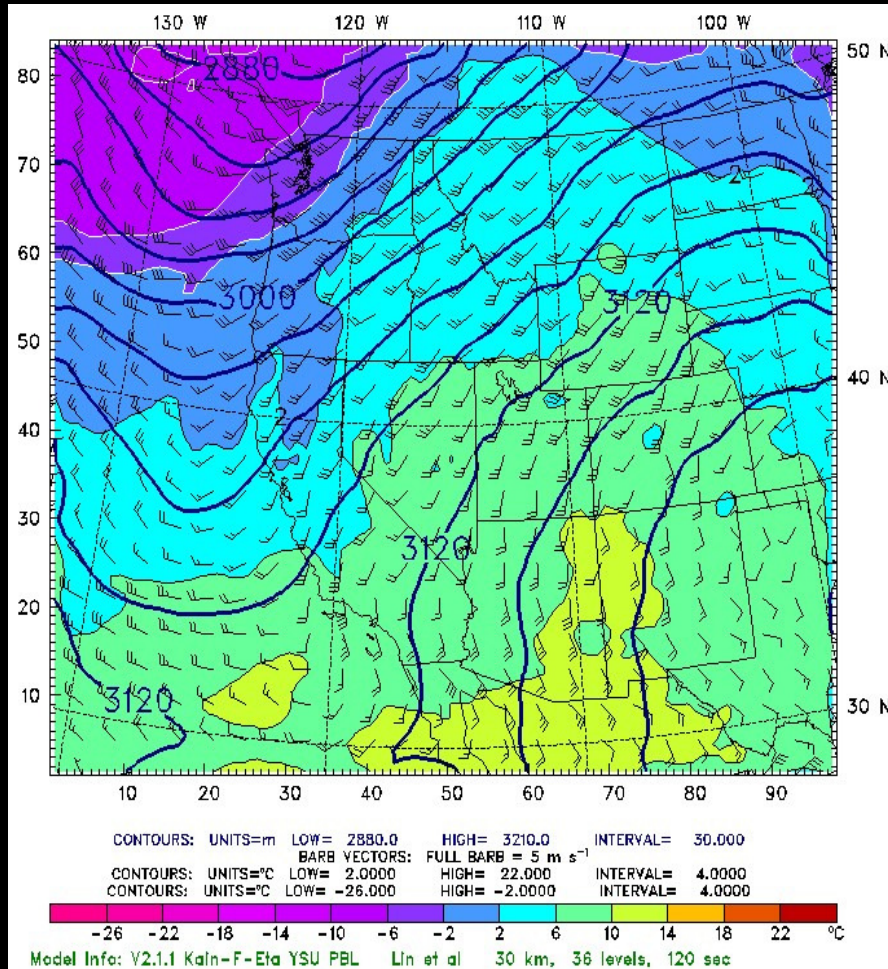


# Reducing Uncertainties

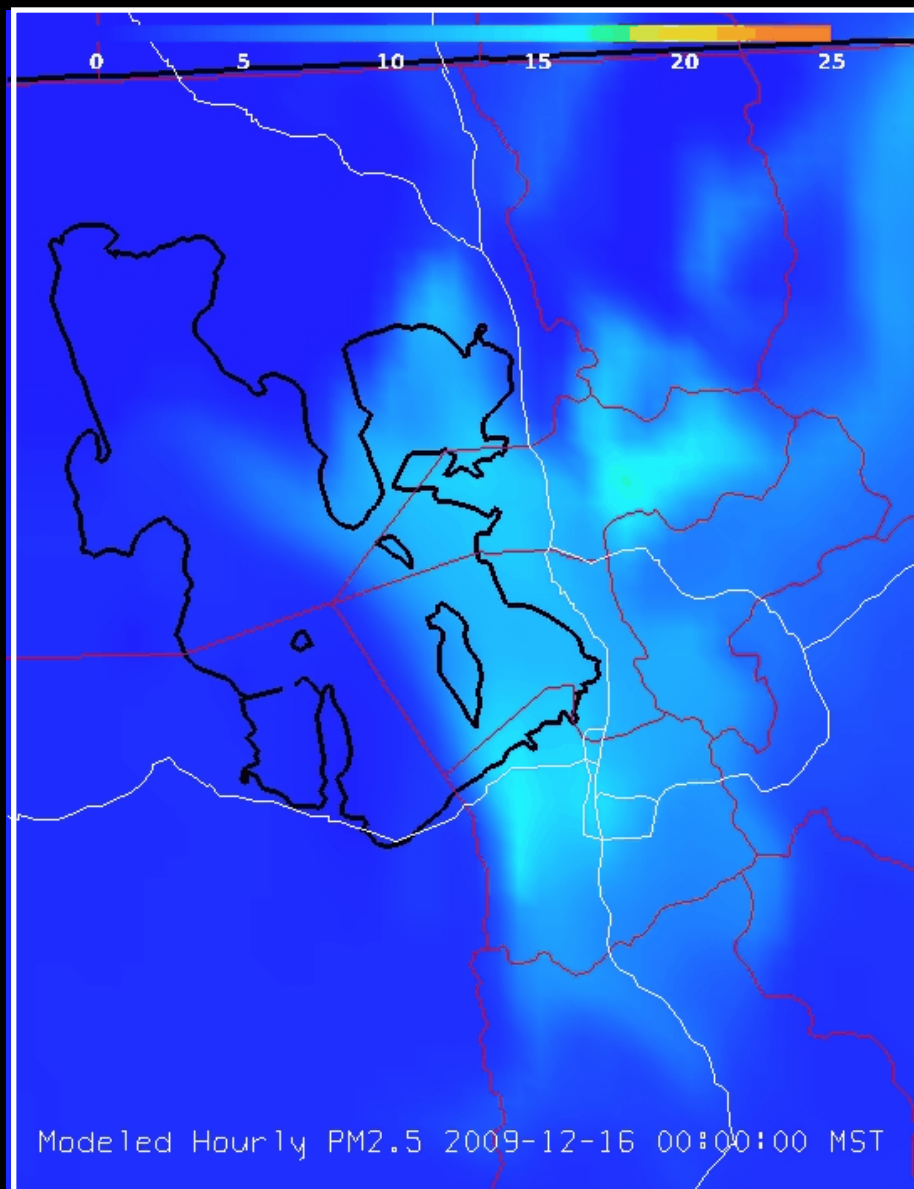




# Meteorology



# Chemistry - PM<sub>2.5</sub>

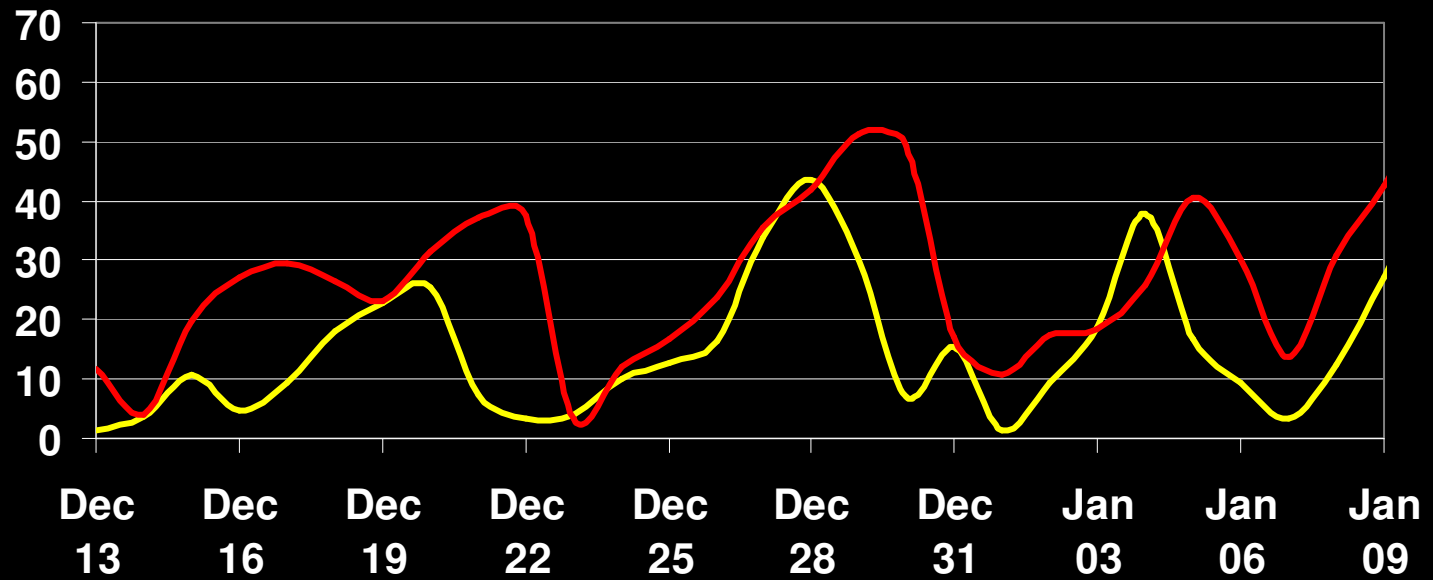


**CMAQ Model**



# Logan

**24-Hour  
PM2.5**  
(ug/m3)

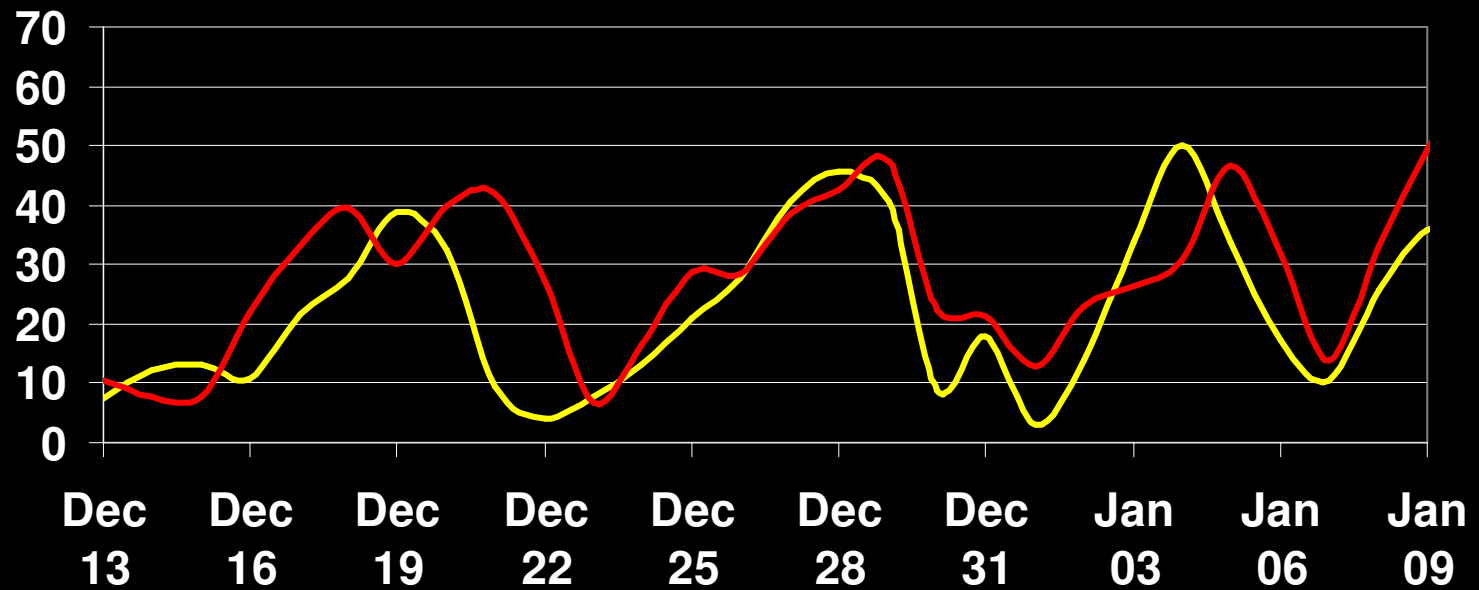


**Observed 24-Hour Average PM2.5**

**Modeled 24-Hour Average PM2.5**

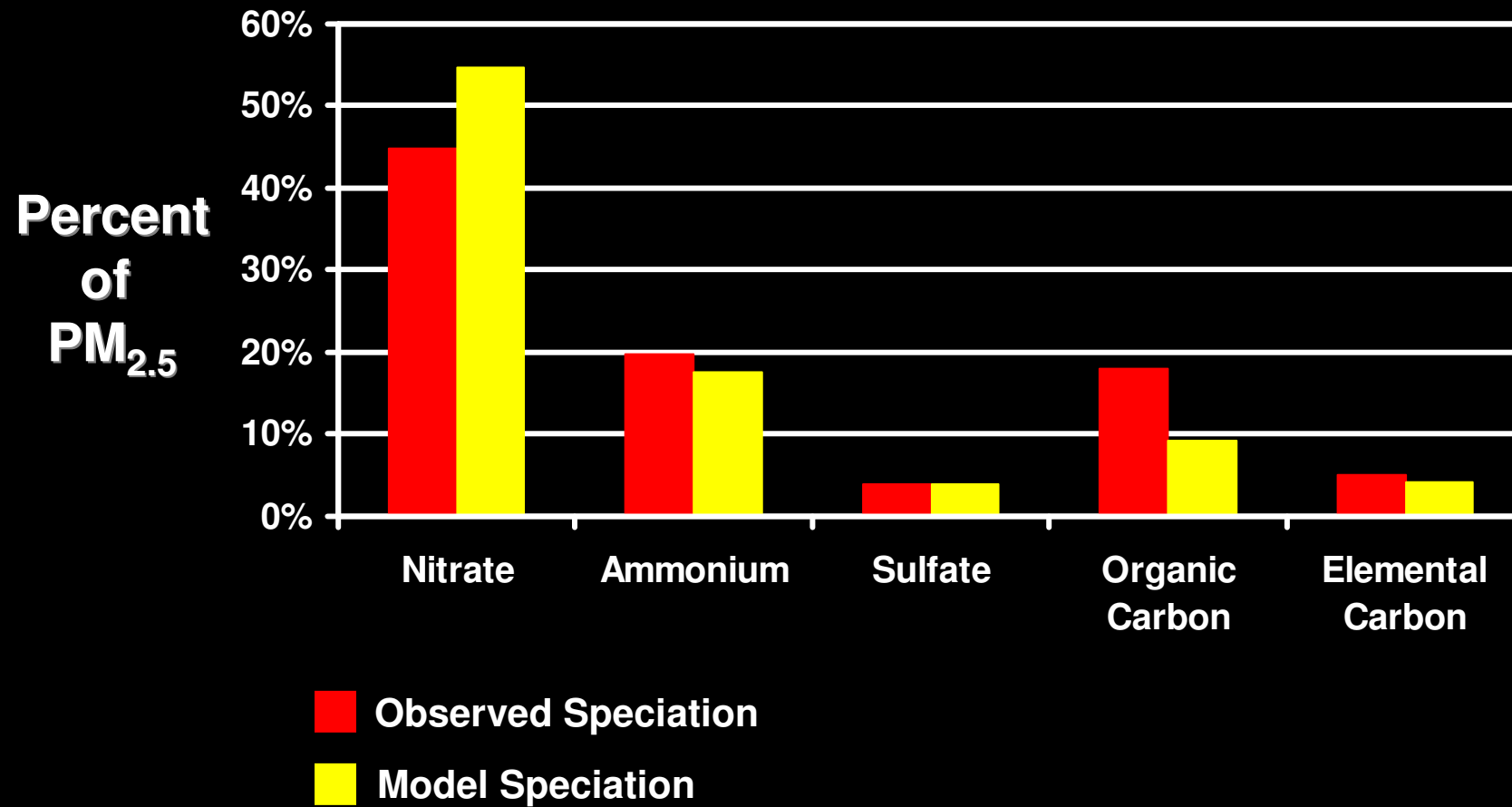
# Salt Lake City

**24-Hour  
PM2.5  
(ug/m3)**

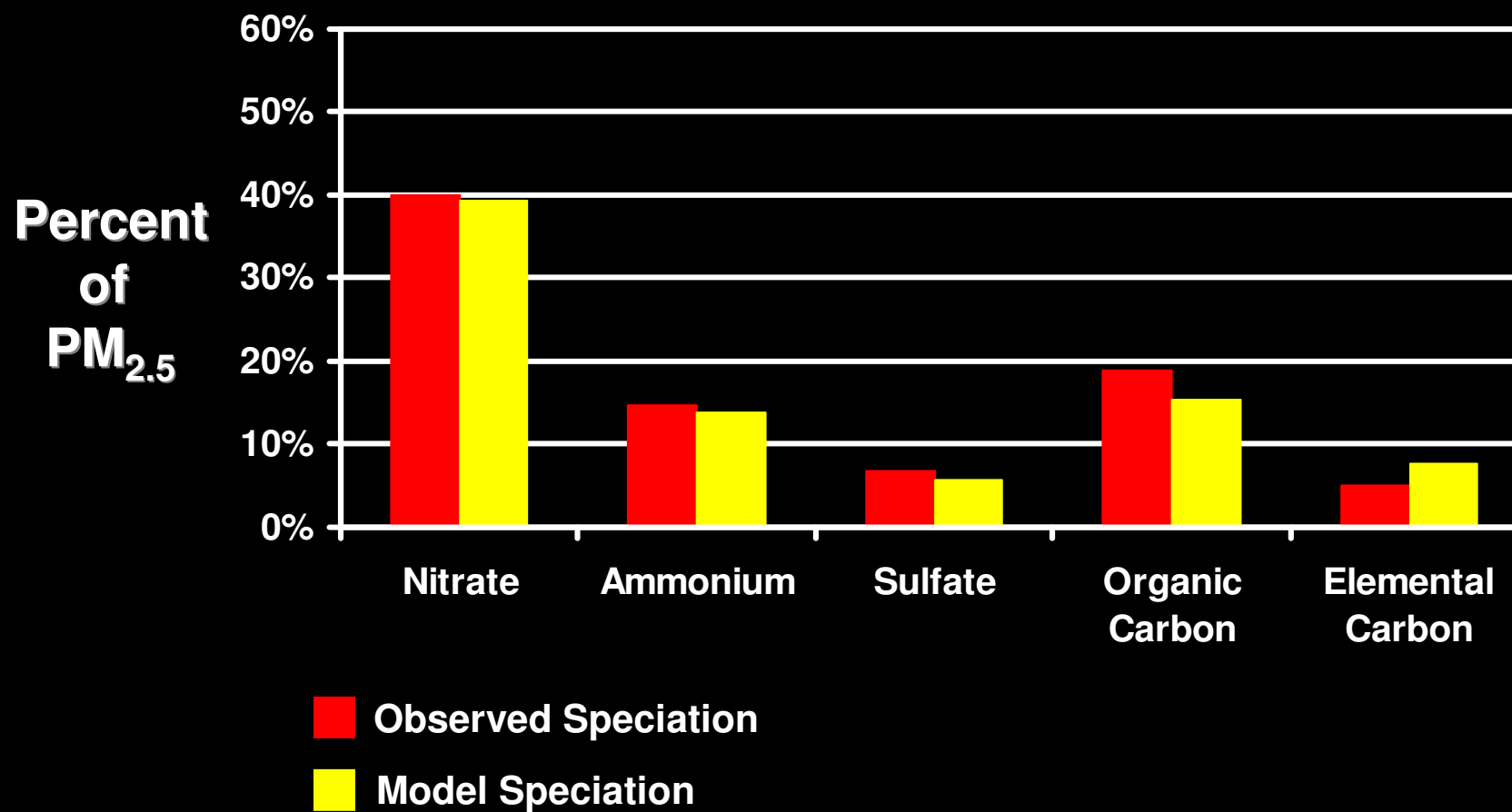


- Observed 24-Hour Average PM2.5
- Modeled 24-Hour Average PM2.5

## Logan



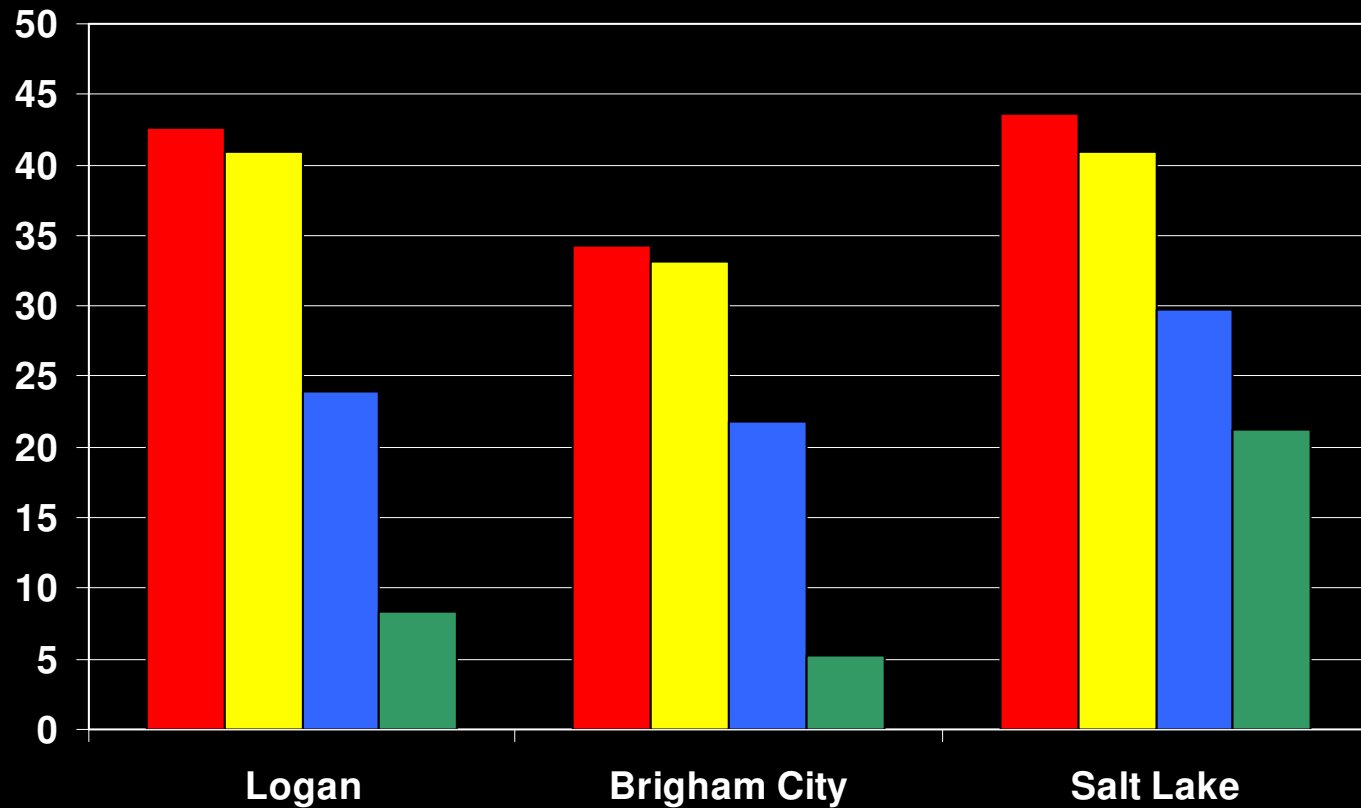
## Salt Lake City





# Modeled PM2.5 Concentrations

PM2.5  
Concentration  
(ug/m3)



■ 2009 Business as Usual

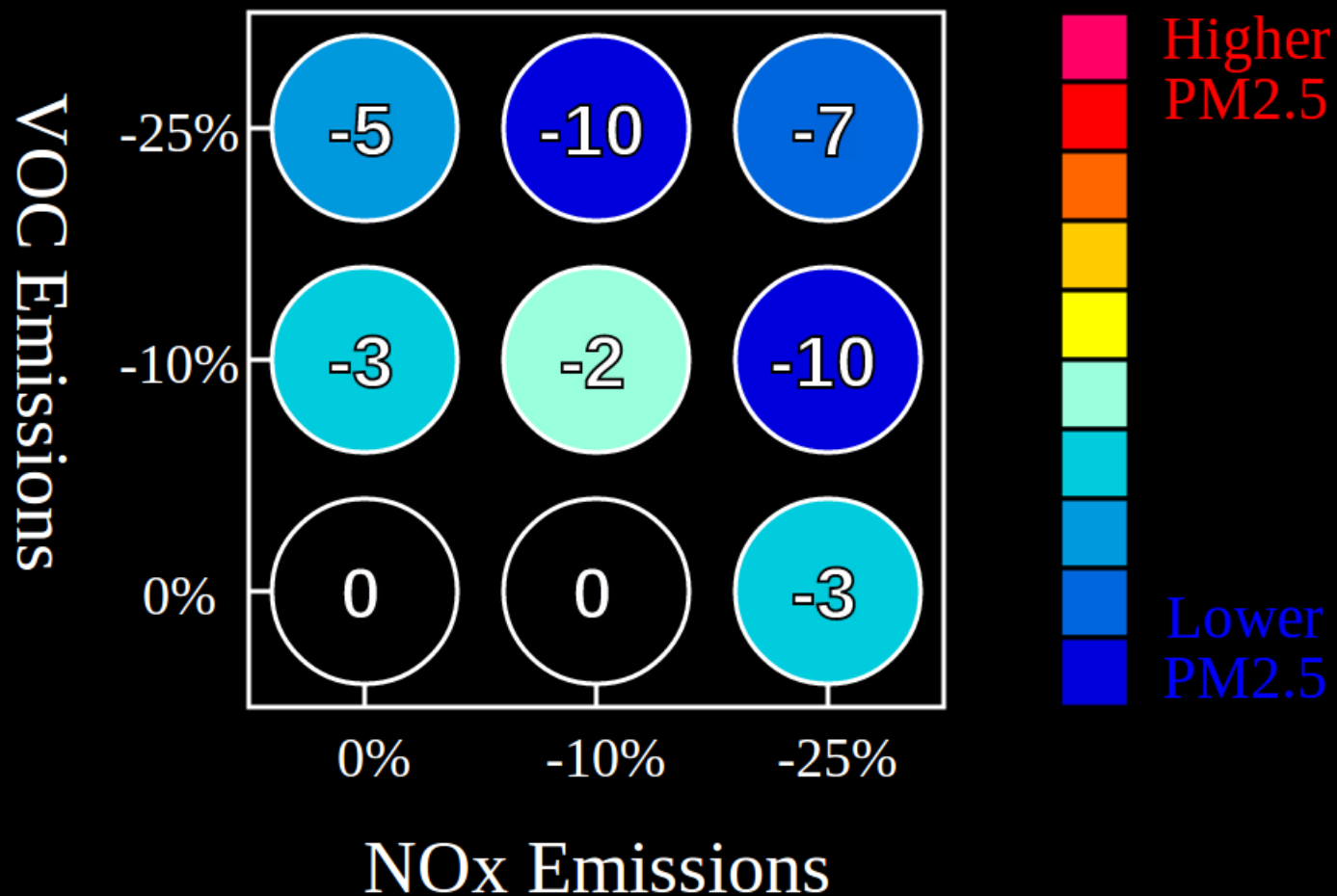
■ With All Large Point Sources Removed

■ With All Vehicles Removed

■ With All Small Business, Residential, Agriculture Removed

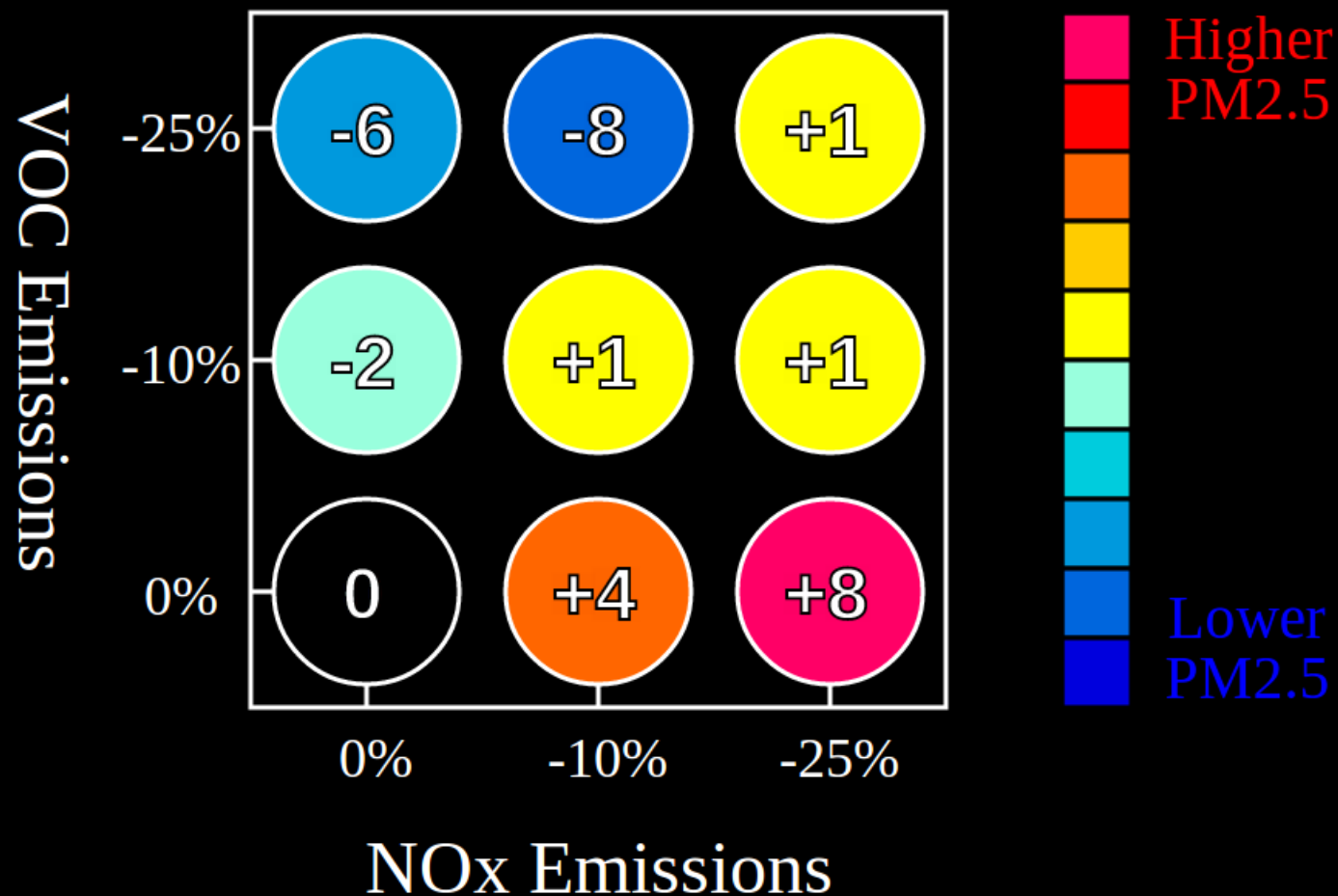
# Model Sensitivity - Logan

Percent Change In 24-Hour PM2.5 (%)



# Model Sensitivity - Salt Lake City

Percent Change In 24-Hour PM2.5 (%)



## 25% Reduction of Organic Carbon

**Salt Lake City**

**-4%**

**Lindon**

**-4%**

**Logan**

**-2%**

**Change in 24-Hour Average PM<sub>2.5</sub> (ug/m<sup>3</sup>)**



Utah

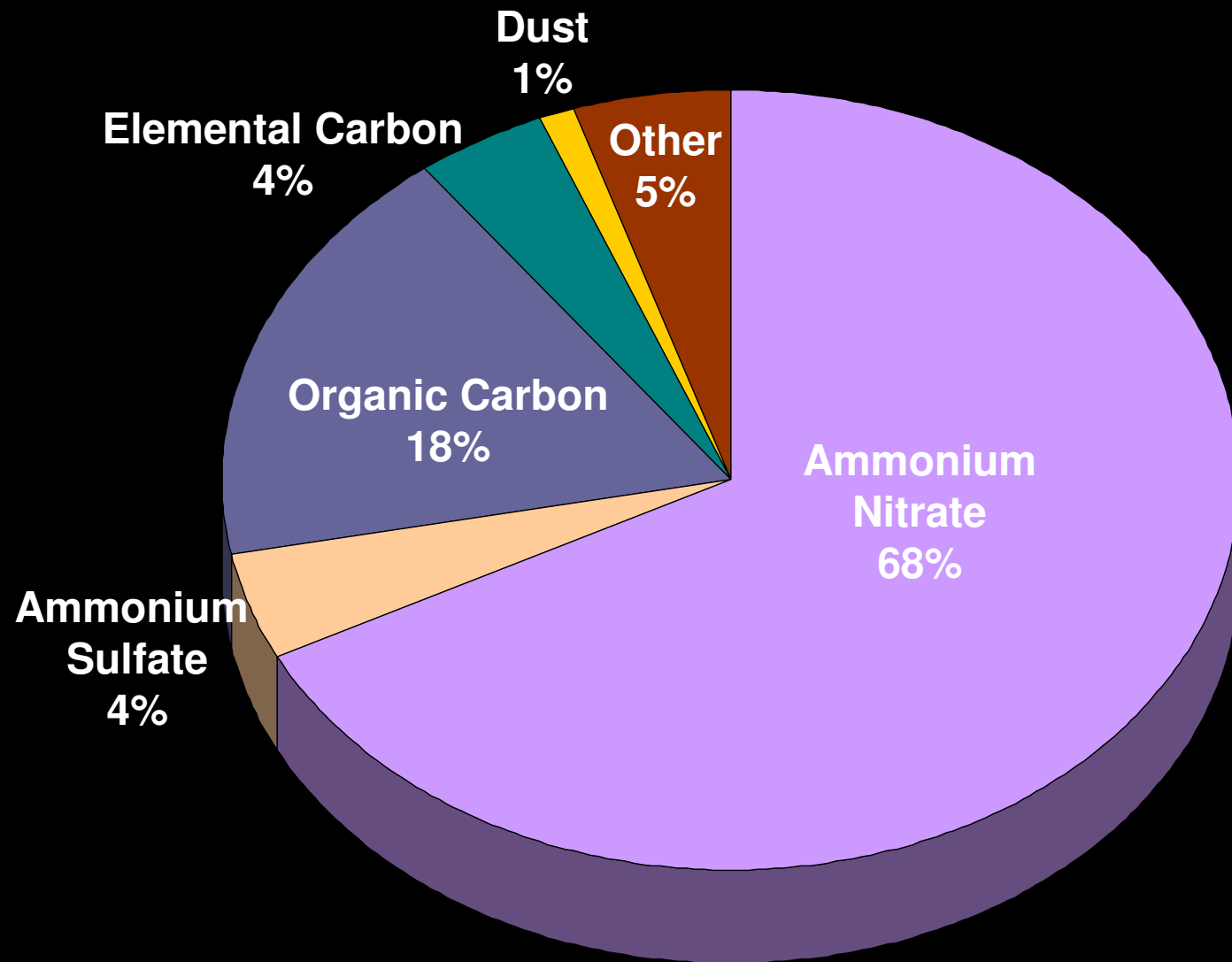
Department of Environmental Quality

Division of  
Air Quality

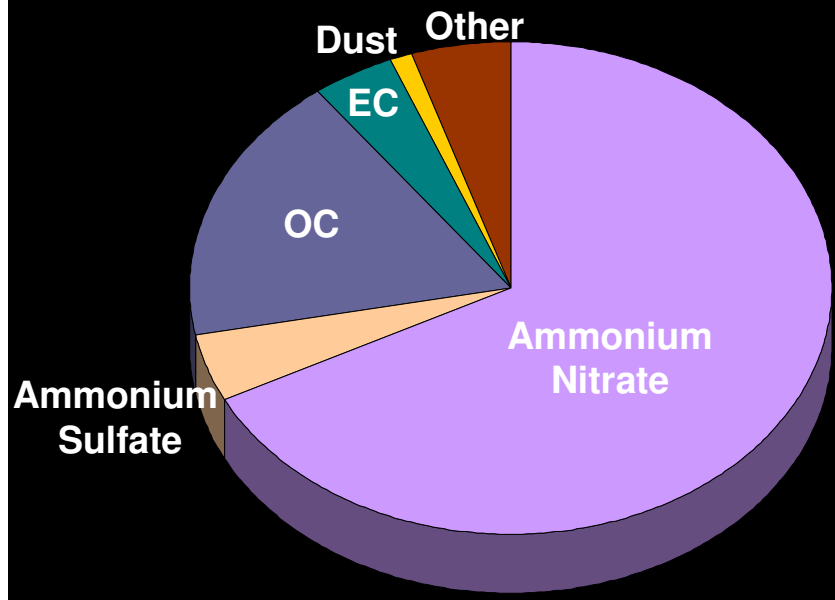
**The Emissions Inventory  
Cache County  
Typical Winter Inversion Day  
January 6, 2010**



# Logan Monitor

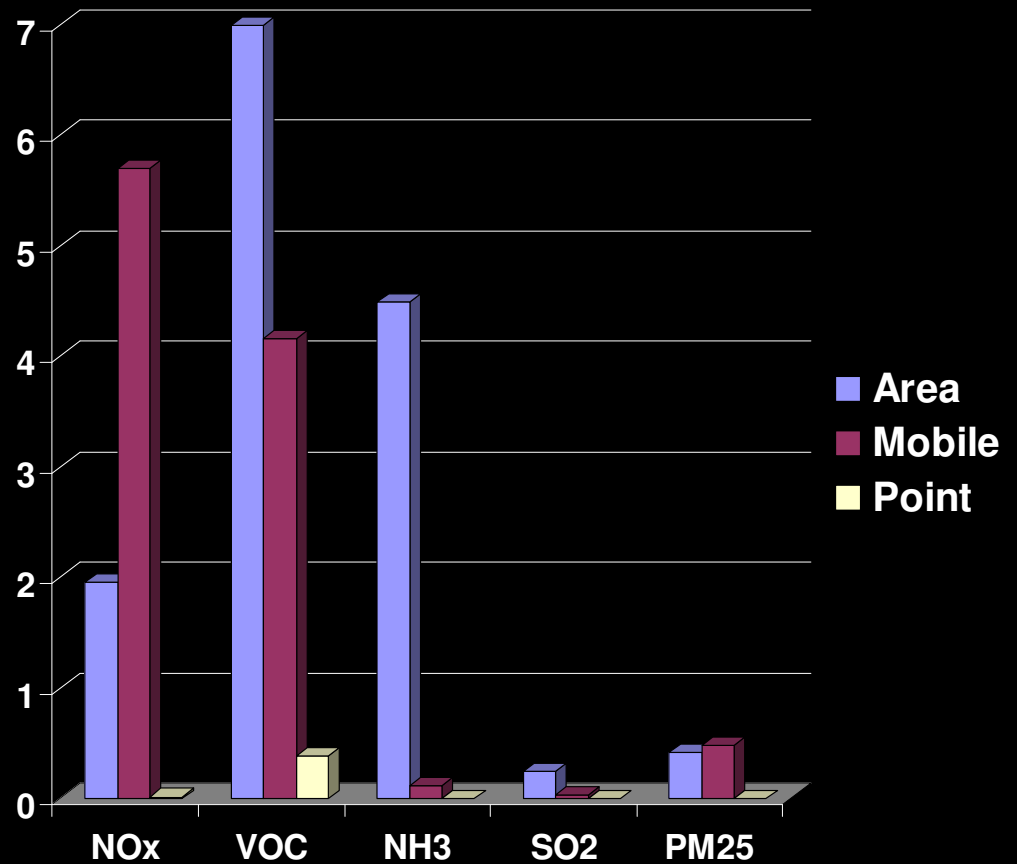


Total PM<sub>2.5</sub>

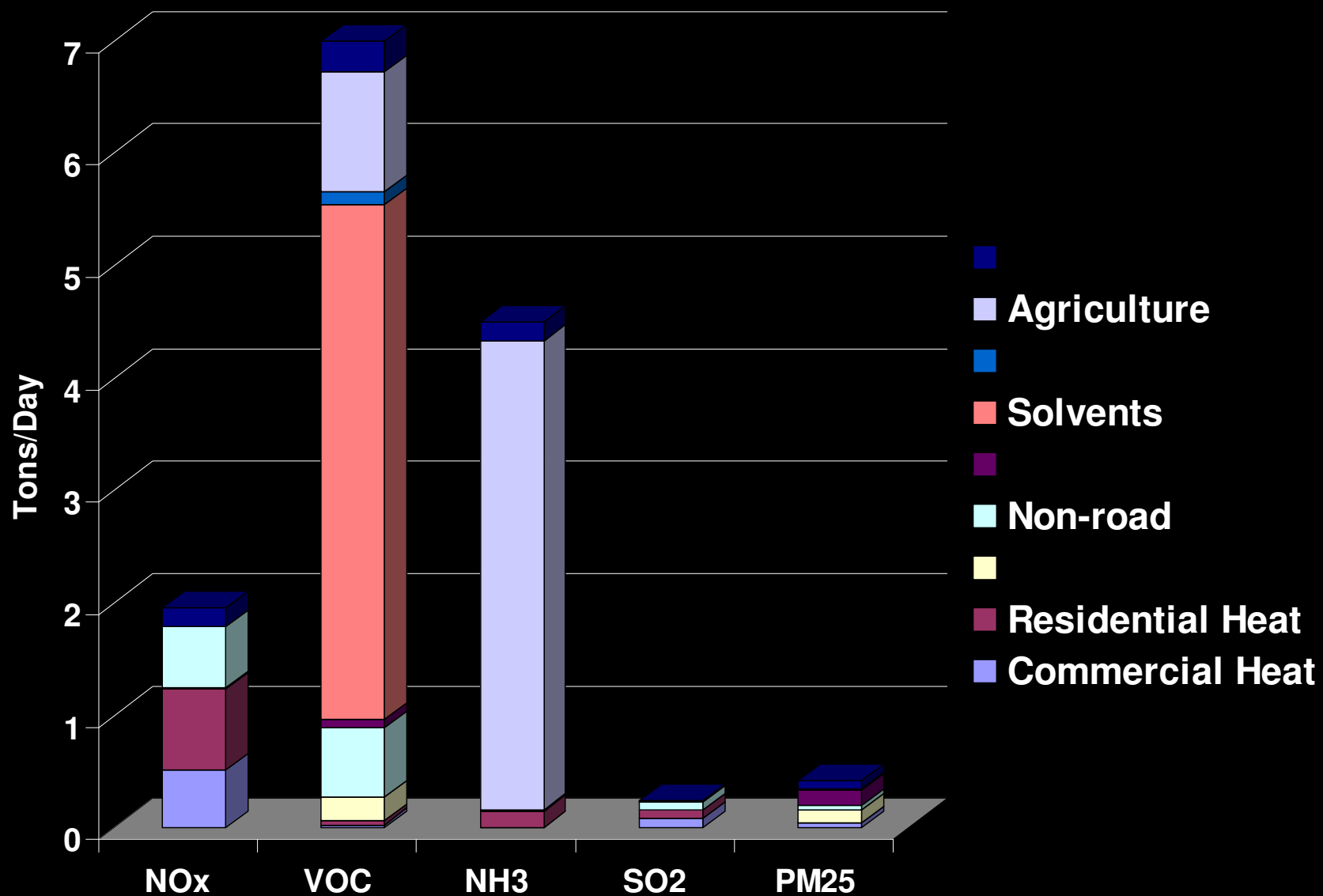


Chemistry  
Atmospheric Dynamics

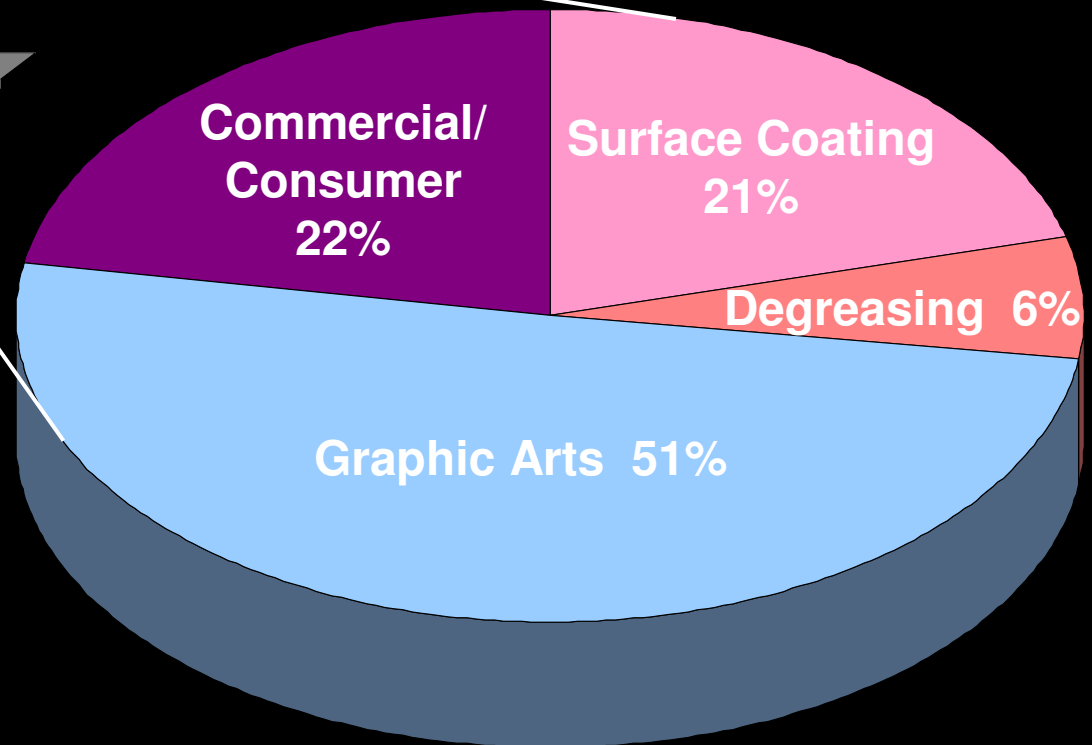
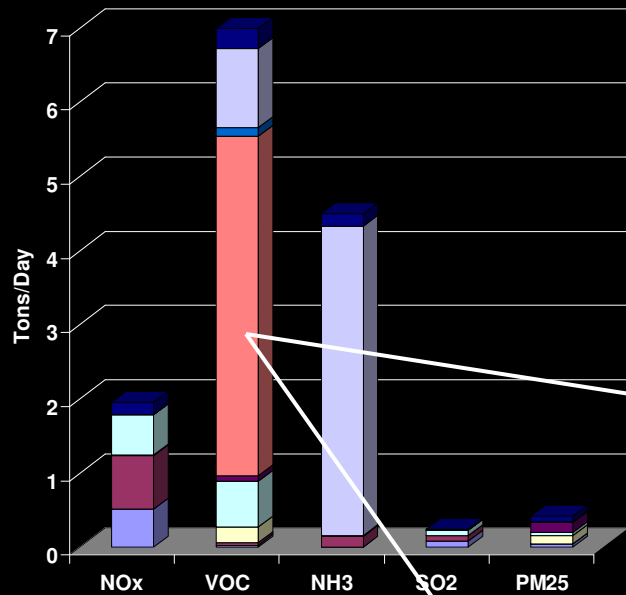
Cache County Daily Emissions

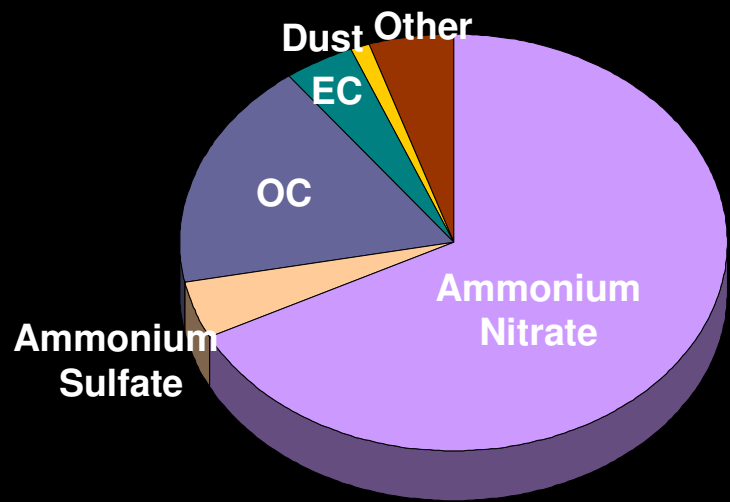


## Area Source

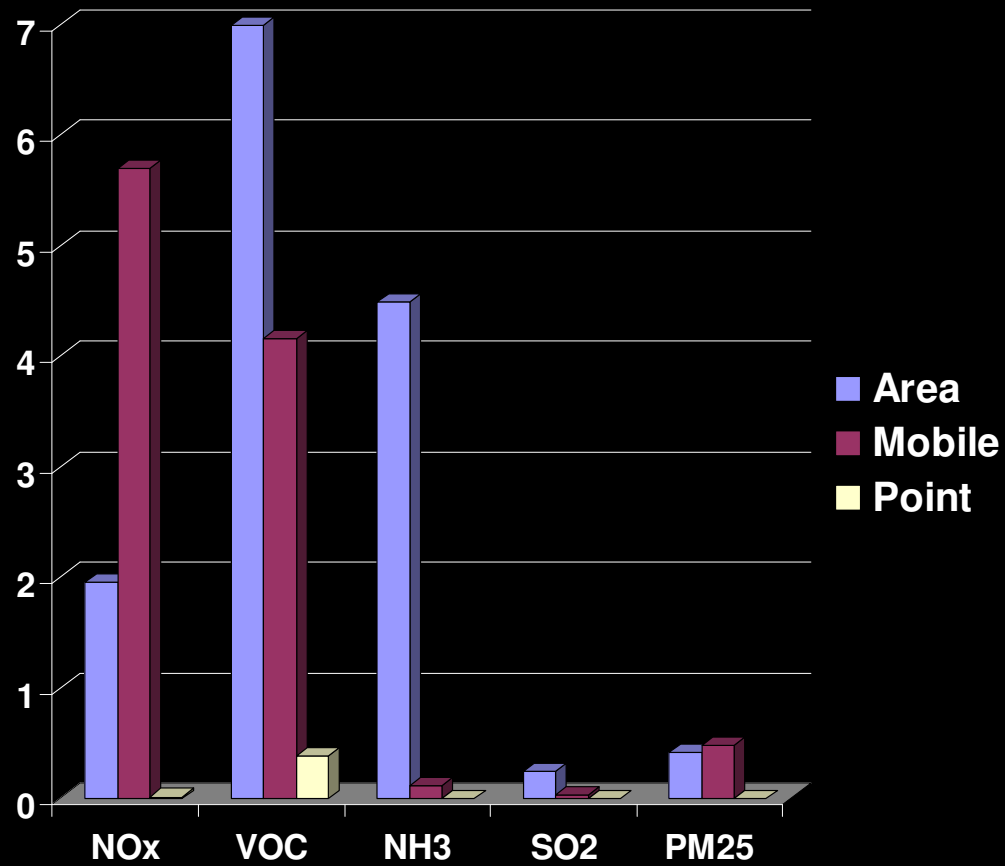


## Major Solvent Categories

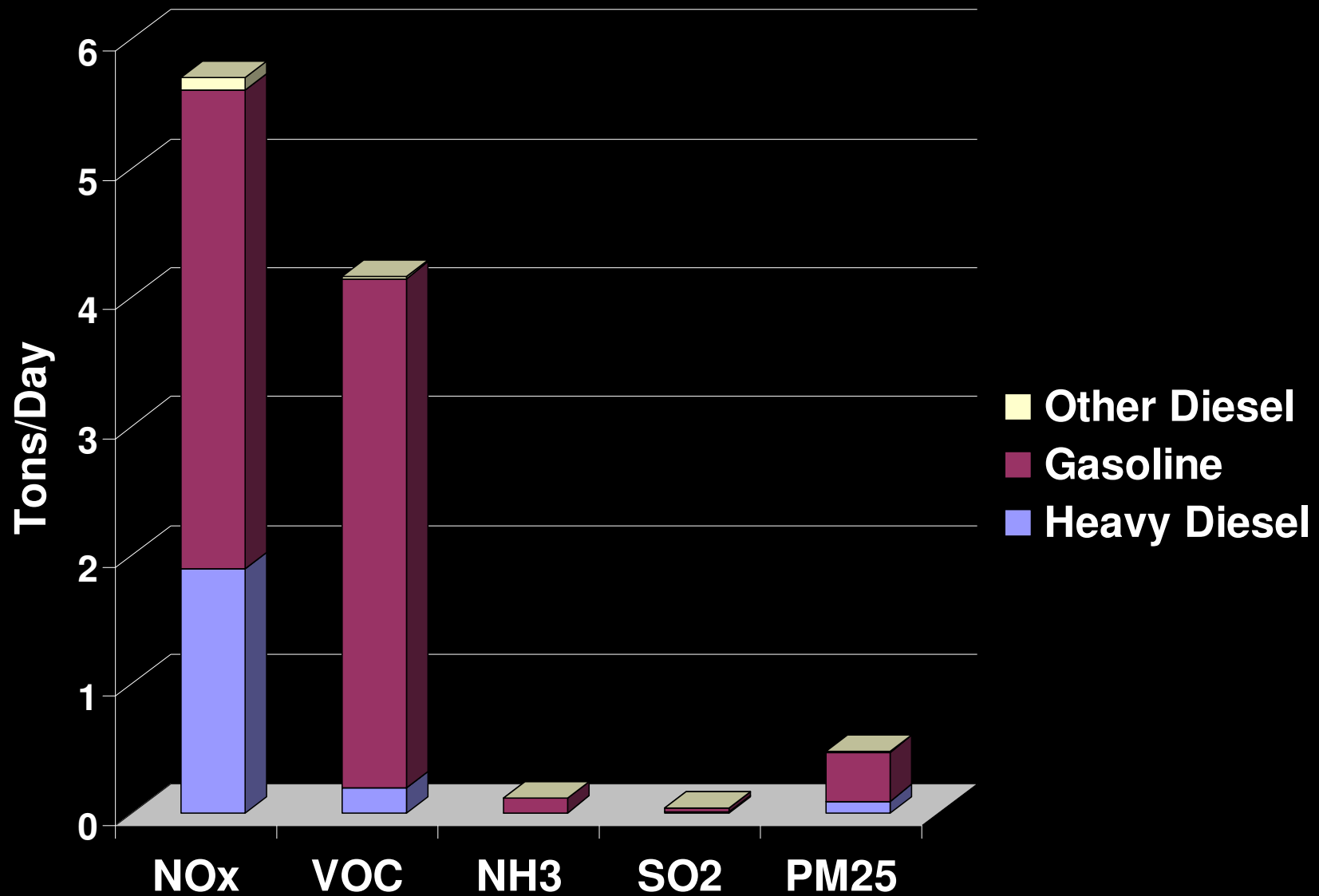




**Mobile Source**



# Autos, Heavy and Light Duty Diesel

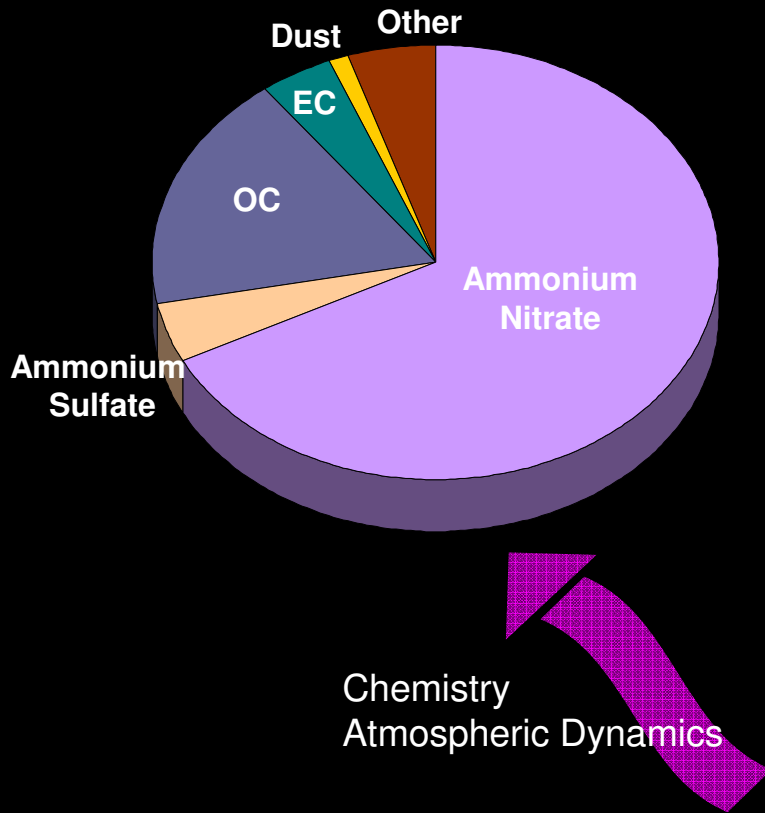




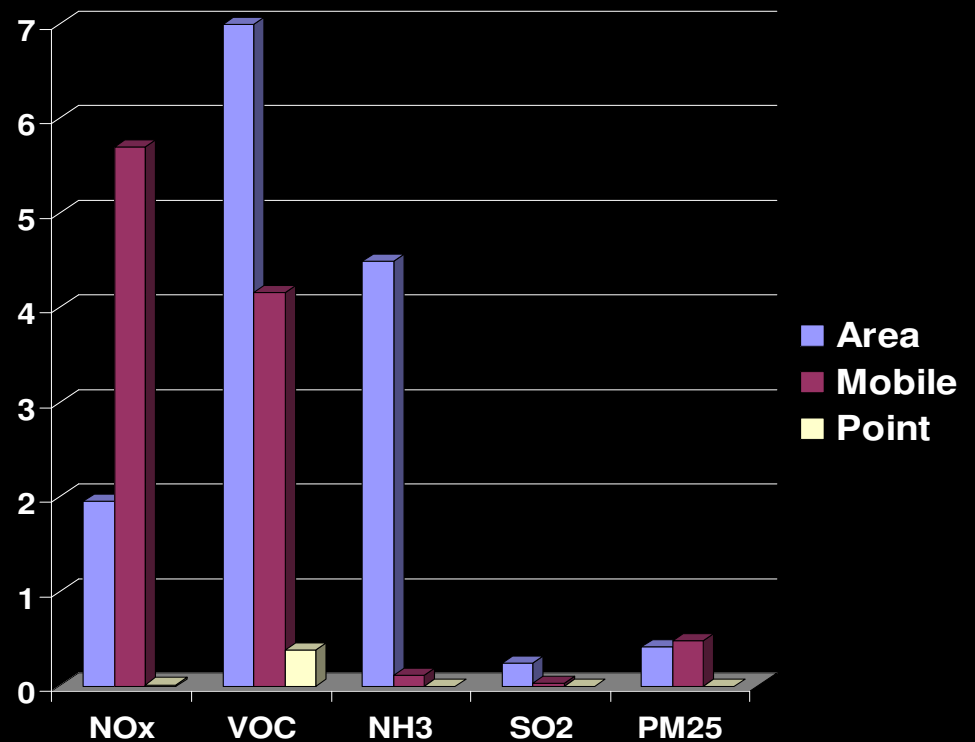
# In Conclusion

## 1. Types of Emissions

- Highest emission levels – not necessarily most appropriate target
- Match Pollutant To PM Species



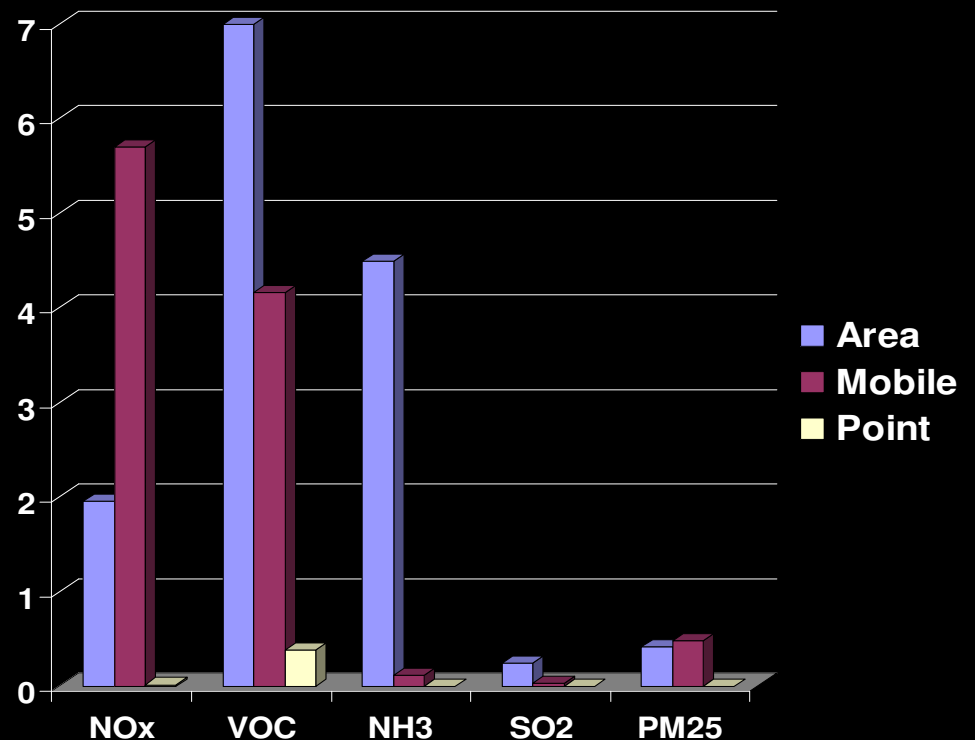
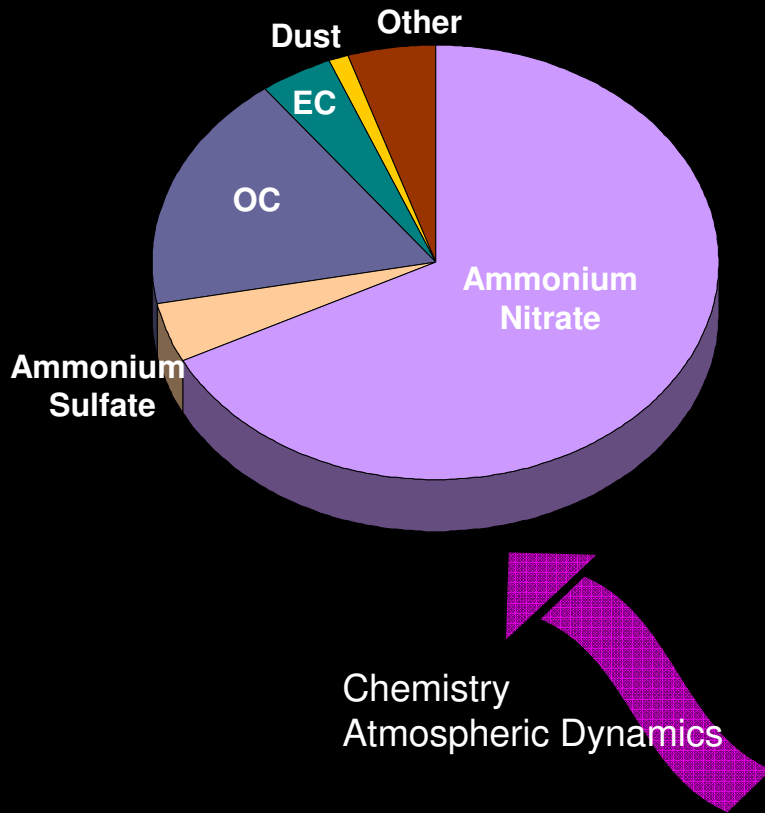
Chemistry  
Atmospheric Dynamics



# In Conclusion

## 2. Emissions Analysis Combined With the Air Quality Model

- Provides Insight and Guidance On Emission Reduction Strategy Effectiveness





Utah

Department of Environmental Quality

Division of  
Air Quality

# RACT / RACM

- Reasonably Available Control...
  - Measures (any source category; point / area / mobile)
  - Technology (point sources only / therefore, a subset of RACM)
- EPA's Rulemakings for PM<sub>2.5</sub> RACM
  - Fine Particulate Implementation Rule (handout to summarize)
  - 40 CFR 51.1010
- 3 Steps to Our Job
  - Identify Options that are Feasible
  - Quantify and Test
  - Select

# Emissions Management Strategies: Issues to Consider

- Will also apply to the precursors that form PM<sub>2.5</sub>
- Will consider all Source Categories in the airshed
  - Large Point Sources will be evaluated for Reasonably Available Control Technology (RACT)
  - Controls on Area Sources such as wood burning and minor source categories will be considered
  - Mobile Sources will be evaluated for various strategies (including on-board diagnostics (OBD), I/M, and strategies to reduce vmt)
- Must Adopt all Measures Necessary to:
  - meet the health standard as expeditiously as practicable
  - Meet any Reasonable Further Progress (RFP) requirements



Utah

Department of Environmental Quality

Division of  
Air Quality

# Emissions Reduction: Ideal





# Emissions Reduction: Reality





# Emissions Reduction Pathway



# Emissions Reduction Pathway: Mobile Source Example



Reduced PM<sub>2.5</sub>  
Emissions from  
Mobile Sources



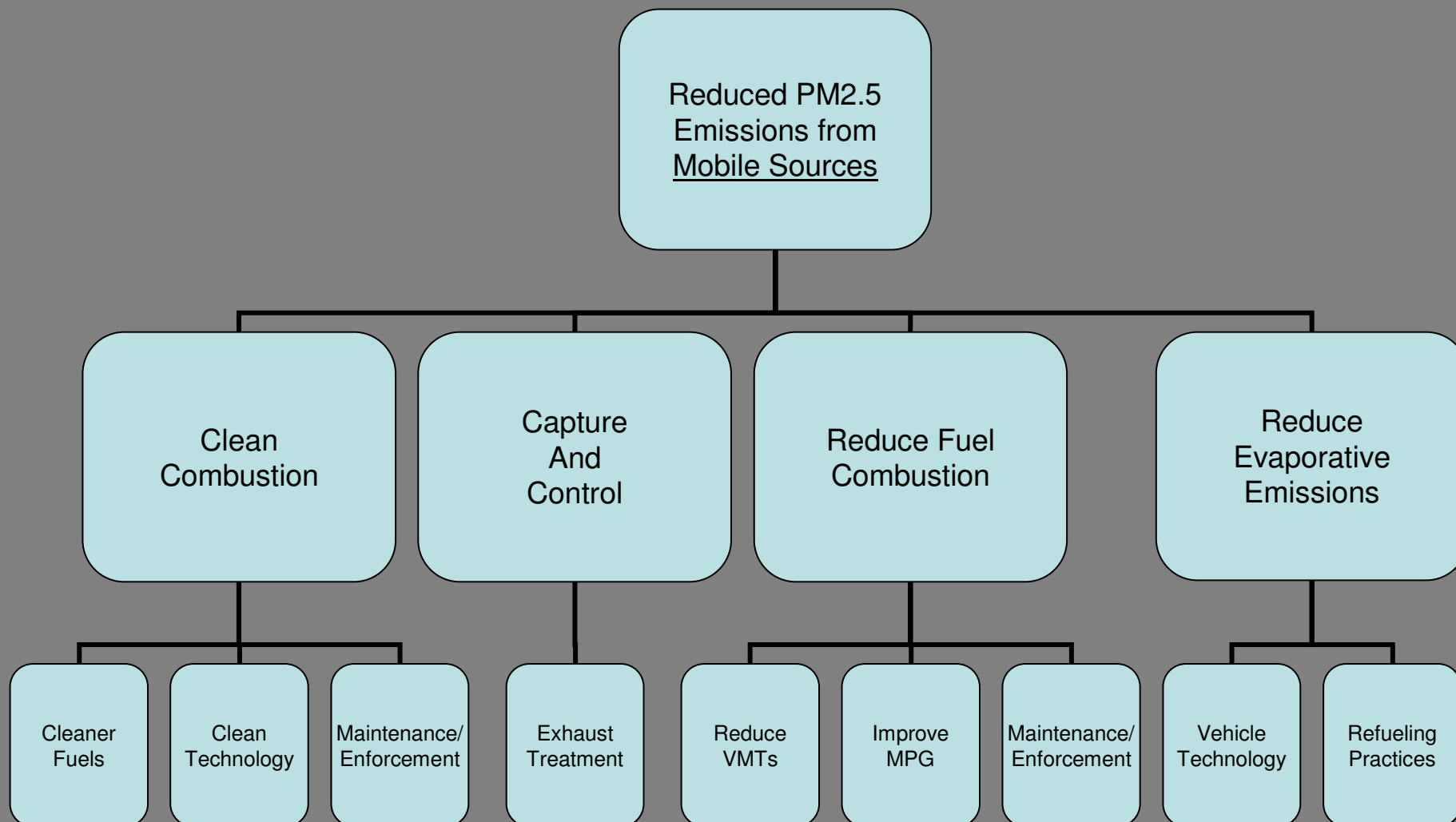
Clean  
Combustion

Capture  
And  
Control

Reduce Fuel  
Combustion

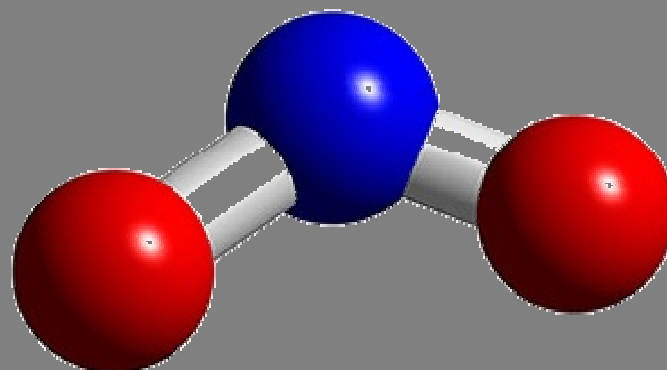
Reduce  
Evaporative  
Emissions

# Emissions Reduction Pathway: Mobile Sources

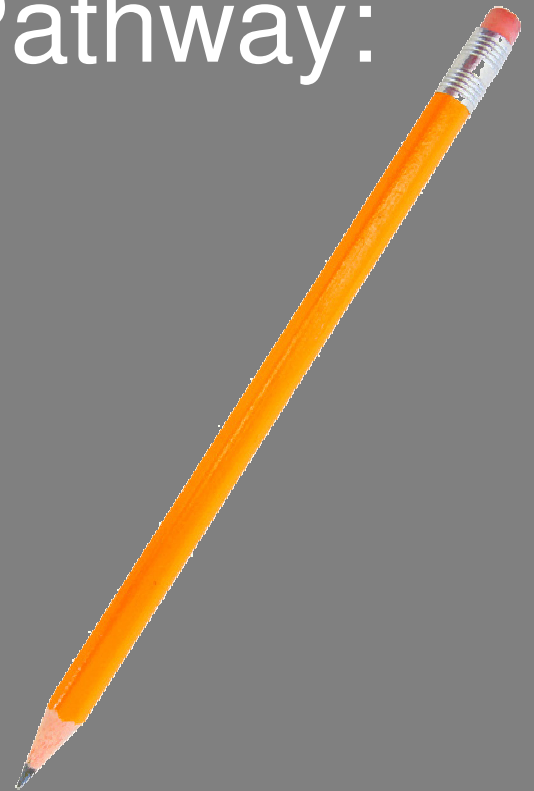


# Emissions Reduction Pathway: Targeted Pollutant(s)

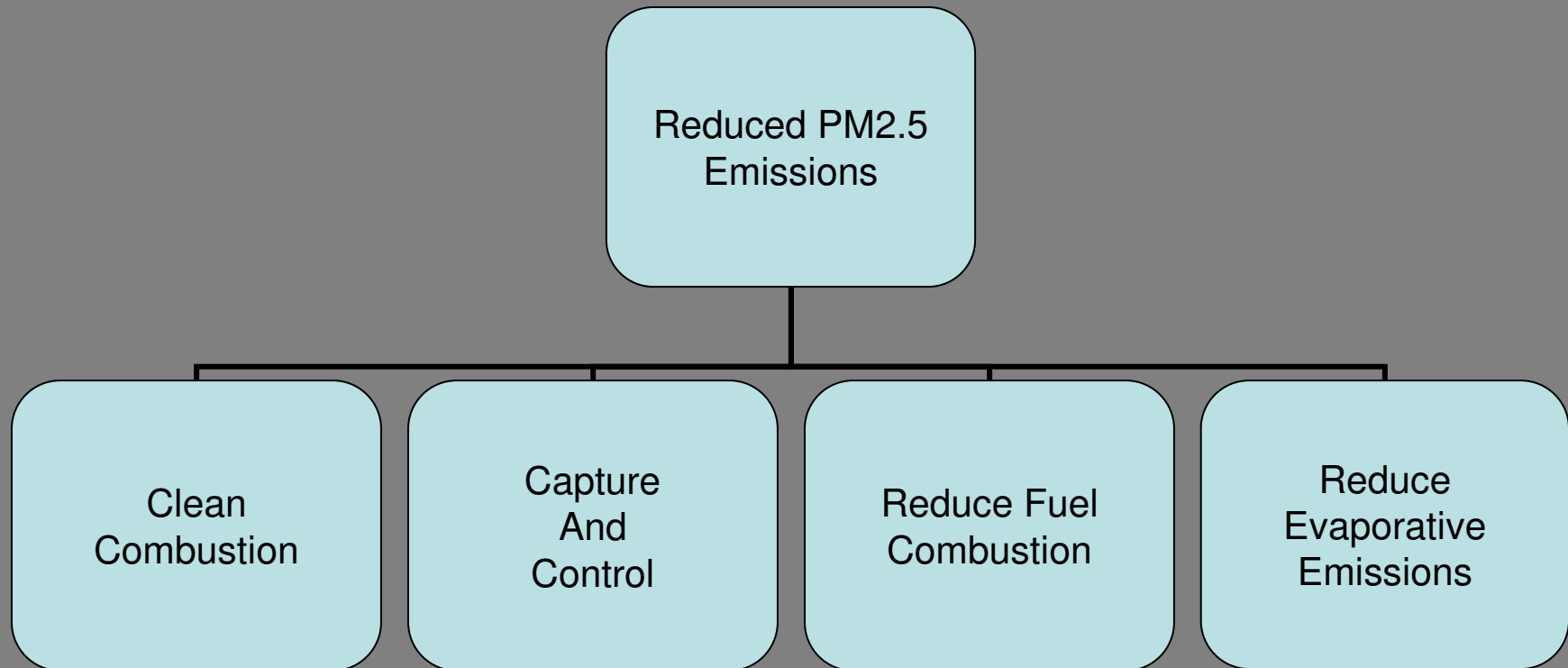
- Does the emission reduction strategy address primary or secondary PM 2.5?
- If secondary, what precursor does the strategy target?
  - NO<sub>x</sub>
  - VOCs



# Emissions Reduction Pathway: Exercise



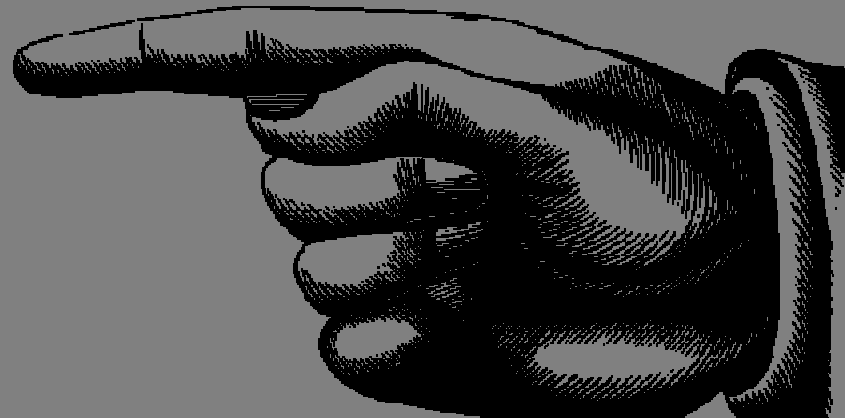
# How does each strategy impact emissions?



- Diesel oxidation catalyst (DOC)
- Cleaner burning fuels
- Reducing car use through enhanced transit
- IM program

# Responsibility for Implementation

- Party (or parties) responsible for implementation?
- Related issues:
  - Authority to implement?
  - How will the measure be funded?
  - Winners and losers?



# Relative Air Quality Benefits

- What is the relative impact of the emission reduction strategy on air quality?
  - Quantifiable?
  - Enforceable?
  - Durable?





# Timing

- When will the air quality benefits occur?
  - Immediate
  - Near-term
  - Medium-term
  - Long-term
- Soon enough to help achieve attainment status?
- Seasonal?



# Relative Implementation Cost

- What are the costs of implementation?
  - Are there savings to help offset costs?
- Who bears the cost?
- At what level are costs to be assessed?
  - Individual/firm?
  - Government entity?
  - Economy-wide?



# Political and Technical Feasibility

- Is there political support for/opposition to the measure?
  - Can support be built through outreach, information sharing, and collaboration?
- Are there technical hurdles that must be addressed before a successful outcome is assured?



# End User Impacts



- How are impacts perceived by affected parties?
  - New costs/burdens?
  - New services, opportunities, or savings for end users?

# Resources

- List of several potential emission reduction strategies across all emissions sources/sectors.
  - Not exhaustive
  - participants are encouraged to consider additional measures.
- Reference list with links to various sources of information on emission reduction strategies.





Utah

Department of Environmental Quality

Division of  
Air Quality



# Constituent Involvement

- Three key roles:
  - 1. WG members inform constituents
  - 2. WG members collect and forward constituent questions/ideas/information
  - 3. WG members help advocate for a successful SIP process among their constituents

# Constituent Involvement

- Inform your constituency
  - Meet with those in your area of interest
  - Consider the emission reduction strategy menu and feasibility exercise in a constituent group
  - Help make constituents aware of education resources available for the process
  - Keep a list of those you know are interested and have involved themselves

# Constituent Involvement

- Collect Questions/Ideas/Information
  - When constituents ask specific questions, please record and forward.
  - Make constituents aware that they can comment directly at [www.govcomments.com](http://www.govcomments.com), request that they provide their contact information when they add comments.
  - Let us know of anything important you learn.
  - Please respond to surveys and materials we send you in a reasonable timeframe.

# Constituent Involvement

- Advocate for a Successful SIP Process
  - WG members are central to our process.
  - With so many challenges, we need a process that works.
  - WG members, regardless of their own interests and positions, can advocate for a successful outcome and pass that goal on to constituents.

# Assignments:

- Consider strategies and rank for feasibility with your constituents.
  - Submit top 5 to DAQ
- Fill out forthcoming Survey within 1 week.
- Carefully read information updates we send you
- Prepare for Meeting 2
  - DAQ will provide web updates, meeting summaries, surveys, schedules updates, and custom information as requested.



# Emission Reduction Strategy Exercise

Control Measure	Source Type	Pathway and Targeted Pollutant	Responsibility for Implementation (list party or parties)	AQ Benefit (Low-Med-High)	Economic Feasibility	Technical Feasibility	Schedule Feasibility	Political Feasibility	End User Impacts (Low-Med-High)
Example: Diesel Retrofits	Mobile	Capture and Control	DAQ, EPA, firms, schools	Low to Med	3-4	4-5	2-3	5	Med

FEASIBILITY DEFINITIONS: Feasibility factors to consider are economic, technical, schedule, and political. Economic feasibility relates to identifying the financial benefits and costs associated with an approach to attainment (would the cost of implementation make the strategy infeasible?). Technical feasibility relates to UDAQ's ability to implement a proposed strategy (is it technically simple, challenging, or impossible to implement?) Schedule feasibility is whether the strategy can yield its benefits within the scheduled timeframe for achieving attainment. Political feasibility relates to whether the strategy can realistically be implemented given social and political constraints. For each of these, attempt to use a scale of 1-5 as follows:

1. Strategy Not Feasible

2. Strategy Hard to Implement

3. Strategy Moderately Difficult to Implement

4. Strategy Moderately Easy to Implement

5. Strategy Easy to Implement